

Application No. 10/530,991

Response to Office Action

AMENDMENTS TO THE DRAWINGS

The attached sheet includes changes to Fig. 5. This sheet replaces the original sheet 3/3 which includes FIG. 5. Reference numeral 33 has been deleted.

Attachment: Replacement Sheet
Annotated Sheet Showing Changes

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REMARKS/ARGUMENTS

The specification and claims have been carefully reviewed in light of the Office Action to which this amendment is responsive. By this amendment, the independent claims each have been amended to improve their form and to distinguish even more clearly over the prior art. In this regard, an effort has been made to correct the informalities noted by the Examiner so as to overcome the §112 objections. New claims 11 and 12 have been added for more completely covering applicant's invention. The Examiner also is requested to approve the accompanying replacement drawing.

Claims 6-8 have been rejected as being anticipated by Dalrymple or Kaneko, and claims 1-5 and 9-10 have been rejected as being obvious over those references. Reconsideration of such rejections is respectfully requested in the light of the foregoing amendments.

Applicant has disclosed and claimed herein an external mix air atomizing spray nozzle assembly adapted for more efficient and reliable operation with substantially reduced performance impeding solids buildup about the air and liquid discharge orifices of the nozzle assembly. The nozzle assembly basically comprises a liquid spray tip for directing liquid supplied to the nozzle, and an air cap having a central opening through which a nose of the spray tip extends for defining an annular atomizing discharge orifice about the spray tip and fan air discharge orifices on opposite sides of the central opening. Pursuant to an important aspect of the invention, the nose extends in a downstream direction past the central air cap opening a distance the greater of at least approximately 2 mm. or approximately 1 mm plus the diameter of the liquid discharge orifice. The central air cap opening, furthermore, is defined in a downstream coplanar end face of the air cap without any portion of the air cap extending downstream of the end face, and the fan air discharge orifices are disposed upstream of the central air cap opening of the spray tip nose liquid discharge orifice, and the air cap end face, preferably formed in V-shaped cutouts in the end face.

Examiner admits that Dalrymple and Kaneko do not teach an external mix air atomizing nozzle in which the liquid discharge nose is arranged "at least 2 mm. or 1 mm. plus the diameter of the liquid discharge orifice downstream of the annular atomizing fluid discharge orifice", but states that the "Application has not disclosed" that such liquid

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discharge orifice "provides an advantage, as used for a particular purpose, or solves a stated problem". (See Office Action, para. 11) The Examiner's attention, however, is directed to Applicant's specification which acknowledges prior art similar to that relied upon by the Examiner in which the liquid discharge orifice defining nose extend short of the claimed distance (See para. [0005] and FIG. 2) and which is susceptible to solids builds up about exposed surfaces of the air cap by pressures created by the atomizing air discharge can interfere with the spray performance, and in some cases, block the atomizing air completely. (para. [0005]) The application further specifically teaches that the protrudance of spray tip nose portion, as set forth in independently claims 1 and 9, has been found to correct such buildup problem and improve spray efficiency at low pressure conditions. (para. [0021]) The cited prior art, which is no more relevant than the admitted prior art disclosed in FIG. 2 of the application, plainly lacks any disclosure of the claimed nozzle arrangement, nor appreciation of its operating advantages.

Independent claim 6 calls for the air cap to have a downstream coplanar end face which defines the annular air discharge office with no portion of the air cap extending downstream of the end face. The claim further calls for the fan discharge orifices to be located upstream of said coplanar end face, the annular air discharge orifice, and the spray tip nose liquid discharge orifice, preferably extending through respective sides of V-shaped cutouts in the end face as called for in claim 7. Dalrymple and Kaneko further fail to disclose an atomizing air end cap with such coplanar end face with no portion of the air cap extending downstream of the annular atomizing air orifice. Hence, claims 6-8 also are believed to patentably distinguish over the art.

From the foregoing, it is believed that the claims as now presented all are directed to features which are neither disclosed nor suggested by the prior art so as to be in condition for allowance. Accordingly, an early action to that effect is respectfully requested.

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If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,



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ANNOTATED SHEET

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